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WEATHER SUMMARY, OCTOBER 1963 - MARCH 1964

TEMPERATURE The unseasonably warm temperatures of September continued into October (one of the warmest Octobers of record) giving Montana one of its longest growing seasons. The first Statewide freeze of the fall did not occur until the weekend of October 26-27, but a number of individual stations had earlier freezes. There was only one period of prolonged cold, December 9-22, with below zero minimums observed at nearly all stations. From the 11th-15th minimums fell to -20° or colder East of the Divide. A second cold snap of short duration occurred March 22-24 when temperatures again fell to well below zero over most of the State. Below zero temperatures occurred at other times at most stations November through March, but such instances were of short duration. Except for December and March, temperatures averaged above normal in all divisions throughout the fall and winter. Characteristic of mild conditions, there was more than usual cloudiness and wind. Extremes for the six months ranged from -43° at Brockway December 14 to 96° at Forsyth 2E, Mizpah 4NW, and Miles City October 4.

PRECIPITATION Precipitation was generally deficient through the fall and winter, but division averages were greater than normal in the central portion in December, the Western and Central divisions in January, and the Western, North-Central, and Northeastern divisions in March. Precipitation was 50 percent or less of normal in much of the North-Central, the south half of the Northeastern, and the southeast corner of the Central divisions. Only three small areas in the State, all in the western third, measured more than normal rainfall. Snow depths in the higher mountains of the west were near or above average by the end of March.

SEVERE STORMS High winds East of the Divide caused considerable soil erosion in the north portion during the winter months. Otherwise, there was little severe storm damage.

WATER SUPPLY FORECASTS AS OF APRIL 1, 1964

WEST OF THE CONTINENTAL DIVIDE The forecast flows for the various streams at a number of points in percent of the 1943-57 averages April-September are: Kootenai at Libby 99 percent; Clark Fork below Missoula 96 percent, near Plains 103 percent; and the Flathead near Polson 108 percent.

EAST OF THE CONTINENTAL DIVIDE Missouri River above Fort Peck Reservoir: Stream flow forecasts for April through September in percent of the 1943-57 average are: Missouri at Toston 93 percent; Marias at Shelby 78 percent; and at Fort Peck Reservoir 90 percent. Flows for the water year, October 1963 through September 1964, in percent of the averages are: Sun River at Gibson Dam 93 percent; Beaverhead at Barrats 77 percent; Big Hole at Melrose, 91 percent; Boulder at Boulder, 103 percent; Jefferson at Sappington, 91 percent; Madison near McAllister, 98 percent; and the Gallatin at Logan, 95 percent. The water supply outlook on the Milk River at Eastern Crossings calls for 50 percent of the March-September average. The April through September forecast on the main-stream of the Yellowstone is for 89 percent of average at Billings, and 84 percent at Sidney. The above forecasts are based on the assumption that precipitation will be near normal during the spring and summer months.

CROP AND LIVESTOCK SUMMARY, OCTOBER 1963 - MARCH 1964

HARVEST Weather during October 1963 was ideal for late harvesting operations.

Combining of the few remaining fields of small grains at higher elevations was completed by early October. Digging of potatoes started in late September and sugar beet lifting began in early October. Many growers delayed digging to take advantage of the late season growth occasioned by the unusually warm weather and lack of killing frosts. Harvest of these crops and alfalfa seed was completed by the end of October, considerably later than normal. Ranchers took advantage of the long season by putting up hay well into October.

SOIL MOISTURE Statewide, two-thirds of the weekly weather crop respondents indicated a shortage of soil moisture in early October. Virtually all reporters in north central and southeastern counties indicated shortages and from one-half to two-thirds of them in other areas stated that moisture was short. The long growing season and below normal precipitation during the winter months resulted in a low soil moisture supply by April 1, 1964. Moisture from snow received during December and March alleviated the situation somewhat but was insufficient to restore the accumulated deficiencies in the north central and some eastern areas.

WINTER WHEAT Seeding of winter wheat was completed without interruption by the third week in October, about one week later than a year earlier. Dry soil conditions in several important producing north central counties slowed seeding progress as some growers awaited more favorable soil moisture conditions. Some of the intended acreage was never seeded. Except in this dry area, germination was generally good. The unusually late fall provided favorable growing conditions and wheat was well rooted before going into dormancy. Cheat grass was a

(Over)

serious problem over large areas and some fields were reseeded. Winter wheat went into the winter in fair to good condition except in the drier counties in the western two-thirds of the north central area, and portions of adjoining counties. Erosion and soil movement as a result of high winds was serious in some fields in the north central part of the State. Sub-zero temperatures also hurt winter wheat stands where snowcover was lacking. Cold stormy weather during late March retarded emergence from dormancy. Fields were mostly dormant at the end of that month but wheat was greening in favored locations.

RANGE LIVESTOCK Movement of livestock from summer ranges last fall was relatively slow. Less than 40 percent of the cattle and about 45 percent of the sheep had been moved from ranges and pastures by October 1, compared with 55 and 60 percent, respectively, a year earlier. Movement to market was likewise slow, partly because of low prices and also many ranchers chose to graze stock on the good growth of grass. Marketings in November and December were heavier than usual. The unsatisfactory prices, coupled with plentiful feed supplies, resulted in holding on ranches more stock than usual. This together with a larger calf crop caused a build-up of cattle numbers to an all-time high January 1 inventory of 2,674,000 head this year, 15 percent above a year earlier.

Supplies of range feed were generally adequate until the second week of December when snow covered many ranges, and cold weather set in. Chinook winds during the latter part of December melted much of the snow cover and restored grazing in many areas east of the Divide. Most ranges in western Montana remained closed from December 1963 to March this year. Grazing was open in many areas east of the Divide during January, February and March. Because of the extended grazing period made possible by the relatively open winter weather supplies of grasses on ranges were short in many locations. By April 1, 95 percent of the State's range livestock were receiving supplemental feedings of hay and concentrates as ranges were still mostly dormant. Stocks of feed, hay and other roughages were adequate on most ranches but there was increased movement of hay during the latter part of March.

Calving and lambing were underway by mid-February. Seasonally mild weather was favorable to the new-born creatures until a snow storm followed by sub-zero temperatures hit the State in late March. Although losses of calves and lambs during the cold weather were above normal, they were not as heavy as might be expected because adequate storm warnings allowed most farmers and ranchers to shelter their animals before the cold weather set in. Calving and lambing were about 35 percent complete by the end of March.

6-Month Total Precipitation, October 1963 - March 1964 (Inclusive)

Station	Precip-itation	6-Month Normal	Station	Precip-itation	6-Month Normal
WESTERN DIVISION					
Alberton	9.04		Missoula 2 WNW	4.84	5.29
Big Fork 10 S	7.44		Missoula WBAS	4.17	5.49
Creston	6.84		Olney 1 SE	13.33	
Darby	6.19	8.24	Ovando 1 SW	7.49	8.15
Deer Lodge 3 W	2.60		Paradise	6.29	
Drummond	5.46	3.74**	Philipsburg	4.67	5.23
East Anaconda	5.37	4.79	Pleasant Valley	7.78	10.85
Elliston	6.96		Polebridge	11.51	
Essex	21.05		Polson Airport	3.52	6.50
Eureka	6.87		Polson Kerr Dam	4.12	
Fortine 1	6.59	8.44	Saint Ignatius	4.66	5.79
Hamilton	4.19	5.55	Saint Regis	9.56	
Haugan	19.46	22.27	Seeley Lake	12.74	
Heron 2 NW	22.51	24.10	Stevensville	4.60	6.14
Hungry Horse Dam	13.83		Sula	6.96	
Kalispell WBAS	5.71	7.33	Superior	7.43	8.78
Kalispell	5.27		Swan Lake	16.18	
Kila	5.92		Thompson Falls	11.28	12.62
Libby 1 NE	10.16	11.77	Trout Creek	17.60	
Libby 32. SSE	16.04		Troy	15.11	
Lindbergh Lake	14.31		Troy 18 N	23.85	
Lolo Hot Springs 2 NE	11.54		West Glacier	15.59	16.32
Lonepine 1 WNW	3.75	5.89			

SOUTHWESTERN DIVISION

Alder 17 S	2.08		Hebgen Dam	17.23	14.53
Belgrade FAA AP	2.85	4.17**	Jackson	3.01	
Boulder St. School	4.26		Lima	1.70	2.72
Bozeman Ag. College	4.56	6.48**	Norris 3 ENE	2.59	
Bozeman 12 NE	12.99		Norris Madison PH	4.46	5.84
Butte FAA AP	3.98	3.15	Pony	3.53	
Dillon FAAAP	1.49	2.12**	Trident	2.15	
Dillon WMCE	1.58	3.22	Twin Bridges	1.66	
Divide 2 NW	3.01		Virginia City	4.21	4.42
Ennis	1.69	2.28	West Yellowstone	12.48	11.59
Glen	.71		Whitehall	2.06	2.11**
			Wisdom	4.92	

** Estimated normal.

6-Month Total Precipitation, October 1963 - March 1964 (Inclusive)

Station	Precip- itation	6-Month Normal	Station	Precip- itation	6-Month Normal
<u>NORTH CENTRAL DIVISION</u>					
Babb 6 NE	3.11	6.02	Harlem	1.67	3.35
Big Sandy	2.57	2.82	Havre WBAS	1.87	3.28
Blackfoot	2.33		Hays	2.18	
Brady Aznoe	1.42		Iliad	3.39	
Browning	3.43	4.64	Joplin 1 N	1.09	
Chester	2.02		Loma 1WNW	3.02	
Chinook	1.39	3.27	Loring 1C N	.41	
Choteau	1.54	2.11	Malta	1.50	3.00
Cleveland 5 ENE	2.44		Malta 35 S	1.11	
Conrad	1.58	2.69	Phillips 1 S	1.56	
Cut Bank FAA AP	1.16	2.41	Rudyard 30 N	2.68	
Del Bonita	2.13		Saco (Nelson Res.)	1.15	
Dunkirk 14 NNE	2.15	2.73	Shelby AP	.62	
Fairfield	2.69	2.40	Shonkin 7 S	9.36	
Forks 4 NNE	1.01		Simpson 6 NW	1.23	2.04
Fort Assinniboine	1.73	2.69	Sweetgrass	1.65	
Fort Benton	4.40	4.45**	Telegraph Creek	1.60	2.76
Geraldine	3.49		Tiber Dam	1.23	
Gildford	1.84		Turner	1.08	
Goldbutte 7 NE	2.08		Valier	1.61	2.50
<u>CENTRAL DIVISION</u>					
Augusta	1.72	3.76	Lenep 5 SW	4.92	
Austin 1 W	5.97		Lewistown FAA AP	3.85	4.50
Barber	1.62		Lincoln 14 NE	8.80	
Canyon Ferry PH	4.32		Lincoln RS	8.70	
Cascade 5 S	3.91	3.82	Martinsdale 3NNW	2.44	3.05**
Cascade 20 SSE	3.69		Melstone	1.97	3.30
Denton	3.57		Moccasin Exp. Sta.	3.33	3.09
Flatwillow 4 ENE	1.57	3.04	Raynesford 1 W	4.06	
Gibson Dam	3.94	5.43	Roundup	1.09	2.71
Grass Range	3.49		Roy 8 NNE	2.62	
Grass Range 15 NNE	1.94		Ryegate 18 NNW	2.22	
Great Falls WBAS	4.77	4.35	Sun River 5 SW	2.50	
Harlowton	2.51		Toston 3 SW	2.93	
Helena WBAS	4.04	3.36	Townsend	3.81	
Holter Dam	2.52	3.42	Utica 11 SW	4.60	
<u>SOUTH CENTRAL DIVISION</u>					
Ballantine	1.65	3.59	Kirby 1 S	8.14	
Big Timber	1.85	4.30	Livingston	2.23	4.29
Billings Water Plant	2.28	3.97	Livingston FAA AP	2.79	4.14**
Billings WBAS	3.63	4.50	Melville 4 W	2.67	
Bridger	3.15		Mystic Lake	4.64	8.77
Broadview	2.21		Red Lodge	5.96	6.63
Busby	2.79	3.22	Wilsall	4.51	
Columbus	2.03	3.75	Wilsall 8 ENE	6.99	
Custer	1.10		Wyola	3.74	5.13**
Huntley Exp. Sta.	1.60	3.52	Yellowstone Park NE	11.41	
Hysham	2.02		Yellowtail Dam	3.62	
Joliet	3.27				
<u>NORTHEASTERN DIVISION</u>					
Bloomfield 6 E	1.04		Mosby 18 N	1.22	
Bredette	1.15		Nohly 3 WNW	1.39	
Brockway	.69		Opheim 10 N	.86	
Circle	.69	2.05**	Opheim 12 SSE	.90	
Culbertson	1.59	2.58	Poplar	.96	2.37
Fort Peck PP	1.64		Redstone	.86	
Frazer	1.04	3.08	Richey	1.19	
Glasgow WBAS	1.64	3.01	Savage	.72	2.59
Glendive	1.63	2.82	Scobey	2.31	
Hinsdale	2.28		Sidney	1.15	2.76**
Jordan	1.80	2.50	Vida	2.02	4.43
Lustre 4 NNW	1.99	1.97	Westby	1.71	
Medicine Lake 3 SE	1.88	2.42	Wolf Point 4 ESE	1.99	
Mosby 2 ENE	1.36				

** Estimated normal.

6-Month Total Precipitation, October 1963 - March 1964 (Inclusive)

Station	Precip- itation	6-Month Normal	Station	Precip- itation	6-Month Normal
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SOUTHEASTERN DIVISION

Albion 1 N .	1.82		Mildred	1.48	2.80
Birney 2 SE	2.47		Miles City	2.45	
Boyes	1.95		Miles City FAA AP	3.05	3.13
Brandenberg	2.93		Moorhead 9 NE	2.59	
Broadus	2.16	3.75**	Otter 9 SW	5.30	
Carlyle 10 W	1.34		Ridgway 1 S	.95	
Colstrip	2.98	4.65	Rock Springs	.95	
Ekalaka	2.05	2.90	Terry	.55	
Forsyth 2 E	1.64		Terry 25 NW	1.09	
Ingomar 11 NE	.78		Wibaux 2 E	.54	
Lame Deer	4.02				

** Estimated normal.

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